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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/840,577	04/23/2001	Oliver Heid	P01,0139	3801
26574	7590	12/30/2003	EXAMINER	
SCHIFF HARDIN & WAITE 6600 SEARS TOWER 233 S WACKER DR CHICAGO, IL 60606-6473			VARGAS, DIXOMARA	
			ART UNIT	PAPER NUMBER
			2859	

DATE MAILED: 12/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/840,577

Applicant(s)

HEID, OLIVER

Examiner

Dixomara Vargas

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 and 10-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 07/30/01.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-8, 10 and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Sellers et al. (US 6,075,363).

With respect to claim 1, Sellers discloses an electrical coil suitable for use as a gradient coil for a magnetic resonance apparatus, comprising (Figure 4): at least one electrical conductor configured in a coil pattern (#28); a carrier structure formed by a resin casting for said electrical conductor which fixes said coil pattern of said electrical conductor in a predetermined configuration (Column 4, lines 7-44; Figure 4); a cooling device component; and a non-resinous heat insulator disposed between at least one section of said conductor and said carrier structure (Column 4, lines 25-44).

3. With respect to claim 2, Sellers discloses at least a portion of said conductor is a hollow cylinder adapted for guiding a flowing cooling medium therein (Figure 4).

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4. With respect to claim 3, Sellers discloses said at least one section of said electrical conductor is a first section and wherein said cooling device component cools at least one second section of said electrical conductor (Column 4, lines 25-44; Figure 4).
5. With respect to claim 4, Sellers discloses said at least said one second section of said electrical conductor proceeds in an edge region of a spatial extent of said coil (Column 4, lines 25-44; Figure 4).
6. With respect to claim 5, Sellers discloses said coil has a spatial extent forming a hollow cylinder, and wherein said at least one second section of said electrical conductor proceeds in a region of a front side of said hollow cylinder (Figure 4).
7. With respect to claim 6, Sellers discloses said heat insulator surrounds said electrical conductor (Figure 4).
8. With respect to claim 7, Sellers discloses said heat insulator has a lower thermal conductivity than said carrier structure (Column 4, lines 25-44).
9. With respect to claim 8, Sellers discloses said thermal conductivity of said heat insulator is lower by a factor between 1 and 3 than the thermal conductivity of the carrier structure (Column 4, lines 25-55).
10. With respect to claim 10, Sellers discloses said carrier structure includes elements for reducing a non-homogeneity of a magnetic field in which said carrier structure and said electrical conductor are disposed (Column 2, lines 11-17)
11. With respect to claim 13, Sellers discloses said heat insulator is composed of material selected from the group consisting of glass, ceramic, mineral materials and polymer materials (Column 3, lines 10-25).

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12. Claims 1-8 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Nerreter (US 6,525,537).

With respect to claim 1, Nerreter discloses an electrical coil suitable for use as a gradient coil for a magnetic resonance apparatus, comprising (Figures 1 and 2): at least one electrical conductor configured in a coil pattern (#2 and #4); a carrier structure formed by a resin casting for said electrical conductor which fixes said coil pattern of said electrical conductor in a predetermined configuration (#5); a cooling device component (#6 and #8); and a non-resinous heat insulator disposed between at least one section of said conductor and said carrier structure (Column 1, lines 40-59).

13. With respect to claim 2, Nerreter discloses at least a portion of said conductor is a hollow cylinder adapted for guiding a flowing cooling medium therein (Figures 1 and 2).

14. With respect to claim 3, Nerreter discloses said at least one section of said electrical conductor is a first section and wherein said cooling device component cools at least one second section of said electrical conductor (Figures 1 and 2).

15. With respect to claim 4, Nerreter discloses said at least said one second section of said electrical conductor proceeds in an edge region of a spatial extent of said coil (Figures 1 and 2).

16. With respect to claim 5, Nerreter discloses said coil has a spatial extent forming a hollow cylinder, and wherein said at least one second section of said electrical conductor proceeds in a region of a front side of said hollow cylinder (Figures 1 and 2).

17. With respect to claim 6, Nerreter discloses said heat insulator surrounds said electrical conductor (Figures 1 and 2).

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18. With respect to claim 7, Nerreter discloses said heat insulator has a lower thermal conductivity than said carrier structure (Column 2, lines 8-54).

19. With respect to claim 8, Nerreter discloses said thermal conductivity of said heat insulator is lower by a factor between 1 and 3 than the thermal conductivity of the carrier structure (Column 2, lines 8-54).

20. With respect to claim 10, Nerreter discloses said carrier structure includes elements for reducing a non-homogeneity of a magnetic field in which said carrier structure and said electrical conductor are disposed (Figures 1 and 2).

***Claim Rejections - 35 USC § 103***

21. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

22. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sellers et al. (US 6,075,363) in view of Nagano et al (US 6,239,680).

With respect to claims 11 and 12, Sellers discloses the claimed invention except for said heat insulator comprises fibrous material, or high-resistance foam material. However, Nagano discloses the use of foam material (Column 6, lines 20-22). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use Nagano's teachings about the use of foam with Sellers' electrical coil suitable for use as a gradient coil for

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a magnetic resonance apparatus for the purpose of improving the system by avoiding overheating of the coil system by using a more suitable material as a heat insulator.

23. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nerreter (US 6,525,537) in view of Nagano et al (US 6,239,680).

With respect to claims 11-13, Nerreter discloses the claimed invention except for said heat insulator comprises fibrous material; a material selected from the group consisting of glass, ceramic, mineral materials and polymer materials or high-resistance foam material. However, Nagano discloses the use of foam material (Column 6, lines 20-22). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use Nagano's teachings about the use of foam with Nerreter's electrical coil suitable for use as a gradient coil for a magnetic resonance apparatus for the purpose of improving the system by avoiding overheating of the coil system by using a more suitable material as a heat insulator.

### ***Response to Arguments***

24. Applicant's arguments filed October 31, 2003 have been fully considered but they are not persuasive.

25. Applicant argues the following:

The term "ducts," however is non-specific, and provides no more than a general teaching that some sort of pathway should be provided in the resin material for water flowing in a water cooling system. This could mean that the ducts are formed by channels that are molded into the resin material, so that no additional hose or conduit need even be present. Even if the term "ducts" is interpreted to embody some type of hose or conduit that is placed onto or into the resin molding material, there is no teaching or suggestion in the Sellers et al reference as to the structure or material of such a hose or conduit, and certainly there is no teaching that such a hose or conduit, if present, should be formed of non-resinous material, as set forth in claim 1 of the present application.

Moreover, even if some type of hose or conduit were embedded in the resin molding material (regardless of whether such a hose or conduit is composed of non-resinous material), this would not correspond to the structure of claim 1, because claim 1 states that the non-resinous heat insulator is disposed between at least one section of the conductor and the carrier structure that is formed by a resin casting. As explained in the introductory portion of the present specification, and as extensively discussed in Applicant's previous response, the non-resinous heat insulator is for the purpose of protecting the resinous material of the carrier structure from the very high temperatures that develop during the operation of the gradient coil in a magnetic resonance apparatus. This is why it is stated that the non-resinous heat insulator is disposed between at least one section of the conductor and the carrier structure that is formed by a resin casting. In conventional structures, the cooling conduit and the conductors of



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the gradient coil have been arranged so that all, or substantially all, of the heat generated during the operation of the gradient coils must proceed through the resinous carrier material in order to reach the cooling conduit and the coolant therein.

26. The examiner disagrees with applicant arguments because Sellers discloses cooling ducts embedded in the resin molding with the gradient conductor and connected to the cooling unit via cooling lines which indicates that the cooling ducts are between the conductor and the carrier structure at least in one portion. The cooling ducts cools the gradient system with water as a heat insulator and water is known to be non-resinous (Column 4, lines 25-44).

27. In addition, in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the non-resinous heat insulator for protecting the carrier structure from high temperatures during the operation of the gradient coil in the apparatus) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

28. The arguments stated above also apply to the prior art of Nerreter US patent 6,525,537 B2.

### ***Conclusion***

29. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The additional prior art cited at the PTO 892 discloses resin casting carrier structures for the gradient coils or MR systems.

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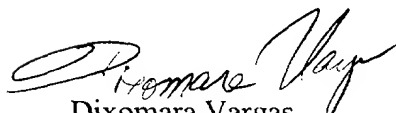
30. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dixomara Vargas whose telephone number is (703) 305-5705. The examiner can normally be reached on 8:00 am. to 4:30 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on (703) 308-3875. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

  
Dixomara Vargas  
Art Unit 2859  
December 15, 2003

  
Diego Gutierrez  
Supervisory Patent Examiner  
Technology Center 2800